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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/471,510	12/23/1999	MOHAMED K. DIAB	MASIMO.149A	7506

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EXAMINER

KREMER, MATTHEW J

ART UNIT	PAPER NUMBER
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3736

DATE MAILED: 02/13/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 09/471,510	<b>Applicant(s)</b> DIAB, MOHAMED K.	
	<b>Examiner</b> Matthew J Kremer	<b>Art Unit</b> 3736	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 January 2002.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3 and 5-17 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 and 17 is/are allowed.
- 6) ☒ Claim(s) 1,5-7,10,12 and 15 is/are rejected.
- 7) ☒ Claim(s) 2,3,8,9,11,13 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
     If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
     \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
     a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Objections*

1. Claim 9 is objected to because of the following informalities: second occurrence of "that" in line 3 should be "than." Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

or

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1, 5-7, 10, 12, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,122,535 to Kaestle et al. Kaestle et al. discloses a method

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and apparatus for determining the concentration of a component and the pulse rate using electromagnetic waves in the red and infrared region. (column 2, line 54 to column 3, line 6 of Kaestle et al.). As shown in Fig. 6, the time-dependent signals that are received are subjected to preprocessing for removing time-dependent drifts from the red and infrared signals as seen in box 110. The signals are subject to time-discrete transformation into the frequency domain which is carried out by means of a Fourier transformation making use of a suitable time window as seen in box 120. A distance spectrum is calculated on the basis of the amplitudes of the red spectrum and infrared spectrum which represent the complex combinatorial values as shown in Fig. 5. The peaks of the distance spectrum are identified and evaluated which results in the pulse rate being determined. (column 7, line 27 to column 11, line 16 of Kaestle et al.). In regard to claims 1 and 12, Kaestle et al. discloses a processor. (column 4, lines 32-52 of Kaestle et al.). The waveform input is processed and potential pulses are identified by using the distance spectrum in Fig. 5. The peaks are the potential pulses. Kaestle et al. develops a physiological model based on probable pulse frequency and useful saturation values. In regard to claims 5-6 and 10, features of the potential pulses are extracted in the distance spectrum such as pulse strength (the amplitude of the peaks) and the period (by evaluating the frequency at the peaks location). In regard to claims 7 and 15, a potential pulse can be rejected if it fails to fulfill predetermined criteria. (column 10, line 55 to column 11, line 5 of Kaestle et al.).

4. Claims 1, 5-6, 10, 12 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,802,486 to Goodman et al. Goodman et al. discloses a method and apparatus for measuring and correlating a patient's heart activity with optical detection of the patient's blood flow. The method and apparatus permit more accurate determinations of blood flow characteristics such as oxygen saturation and pulse rate. The heart activity is detected by monitoring the patient's EKG waveform, and the blood flow is detected by a non-invasive pulse oximeter. The occurrence of the R wave portion of the EKG signal is detected and the time delay by which an arterial pulse follows the R wave is determined to establish a time window in which an arterial pulse is to be expected. The established time window provides the oximeter with a parameter enabling the oximeter to analyze the blood flow only when it is likely to present an arterial blood pulse for waveform analysis. (Abstract of Goodman et al.).

The system routine for processing digital optical pulse information for optical pulses is shown in Fig. 6b. The system begins by continuously evaluating the data from the detected digital optical signal at 644. The data is first evaluated for compatibility with the signal processing at 645. When the data is compatible, it is next evaluated for a maximum signal. A relative maximum is determined and saved at 651. The next value is compared to the saved value, and if it is a new maximum it is saved at 651.

Thereafter, the system evaluates the following data received, bypassing the maximum value section 648-652, to find the maximum slope at 653, again by successive comparisons. When the largest slope value is found it is saved at 658. Thereafter the following data is evaluated, bypassing the maximum and slope calculations, to find the

minimum value corresponding to the end of the pulse at 659-662. When the smallest minimum is found, it is saved at 661 and the slope value saved at 658 is compared to a pre-established minimum threshold to determine whether it is large enough to be a possible optical pulse at 663. If it is not large enough, then the pulse is rejected at 664. The routine begins processing the next possible pulse at 644. If the slope is large enough then the pulse parameters are saved in memory at 667 for evaluating the possible pulse. (column 17, lines 12-52 of Goodman et al.). Fig. 6b of Goodman et al. shows the candidate pulse portion that identifies potential pulses. Fig. 6c of Goodman et al. determines the physiologically acceptable pulses. In regard to claims 5-6, 10 and 15, the physiological model portion extracts characteristic from the pulses such as the pulse amplitude (strength) and period. (column 18, lines 31-38 of Goodman et al.).

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 1, 5-7, 10, 12, and 15 have been considered but are moot in view of the new ground(s) of rejection.

### ***Allowable Subject Matter***

6. Claims 16-17 are allowed.

7. Claims 2-3, 8-9, 11, and 13-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter. The prior art does not teach or suggest determining the statistics of pulses with the waveform input. The prior art does not teach or suggest disregarding a potential pulse that is generally asymmetric. The prior art does not teach or suggest disregarding a potential pulse that has a descending trend that is generally slower than a subsequent ascending trend. The prior art does not teach or suggest disregarding a potential pulse having a signal strength that differs from a short-term average signal strength by greater than a predetermined amount. The prior art does not teach or suggest deriving a pulse density. The prior art does not teach or suggest a plethysmograph model sub-processor that determines physiologically acceptable pulses in triangular waveform output and providing as a pulse output the indices of acceptable pulses.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J Kremer whose telephone number is 703-605-0421. The examiner can normally be reached on Mon. through Fri. between 7:30 a.m. - 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eric Winakur can be reached on 703-308-3940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-0758 for regular communications and 703-308-0758 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0858.



Matthew Kremer  
Assistant Examiner  
Art Unit 3736  
February 8, 2002



ERIC F. WINAKUR  
PRIMARY EXAMINER